

9. Operations and Maintenance

This section summarizes the programs and procedures used to ensure safe and reliable supply of potable water to Anacortes' customers. This section describes water system management and personnel, operator certification requirements, system operations and control, the emergency response program, safety procedures, the cross-connection control program, the records keeping and reporting program, design and construction standards, and any recommended improvements.

9.1. Water System Management and Personnel

Anacortes' water system is under the jurisdiction of the Public Works Department. The water system organization within the department is divided between the Water Treatment Division and the Operations Division. The Water Treatment Division is responsible for the operations and maintenance of the Water Treatment Plant (WTP), including the intake and the high head pumps that pump into the transmission pipelines, the reservoirs, and the individual distribution system pump stations. The Operations Division is responsible for the transmission pipelines and the distribution system.

The WTP has a staff of eleven full-time employees, headed by the Plant Manager. The Plant Supervisor and Division Secretary report directly to the Plant Manager. The Plant Supervisor oversees the daily activities of eight shift operators. The eight operators staff the water filtration plant on a 24-hour basis. Six operators work rotating 12-hour shifts while the other two work a regular 8-hour per day/5-day per week schedule. These shifts are staggered so that (1) someone is on duty around-the-clock, and (2) several people are on duty during certain shifts to perform operations and maintenance tasks that require more than one person.

The Operations Division has a staff of ten full-time employees, headed by the Operations Manager. This position is directly supported by two administrative positions and the Water Maintenance Manager. The Water Maintenance Manager oversees the day-to-day operations and maintenance activities with a staff of one Water Maintenance Lead Worker and seven Water Maintenance Workers.

An organization chart for the Water Treatment Division and Operations Division is provided in Figure 9-1.

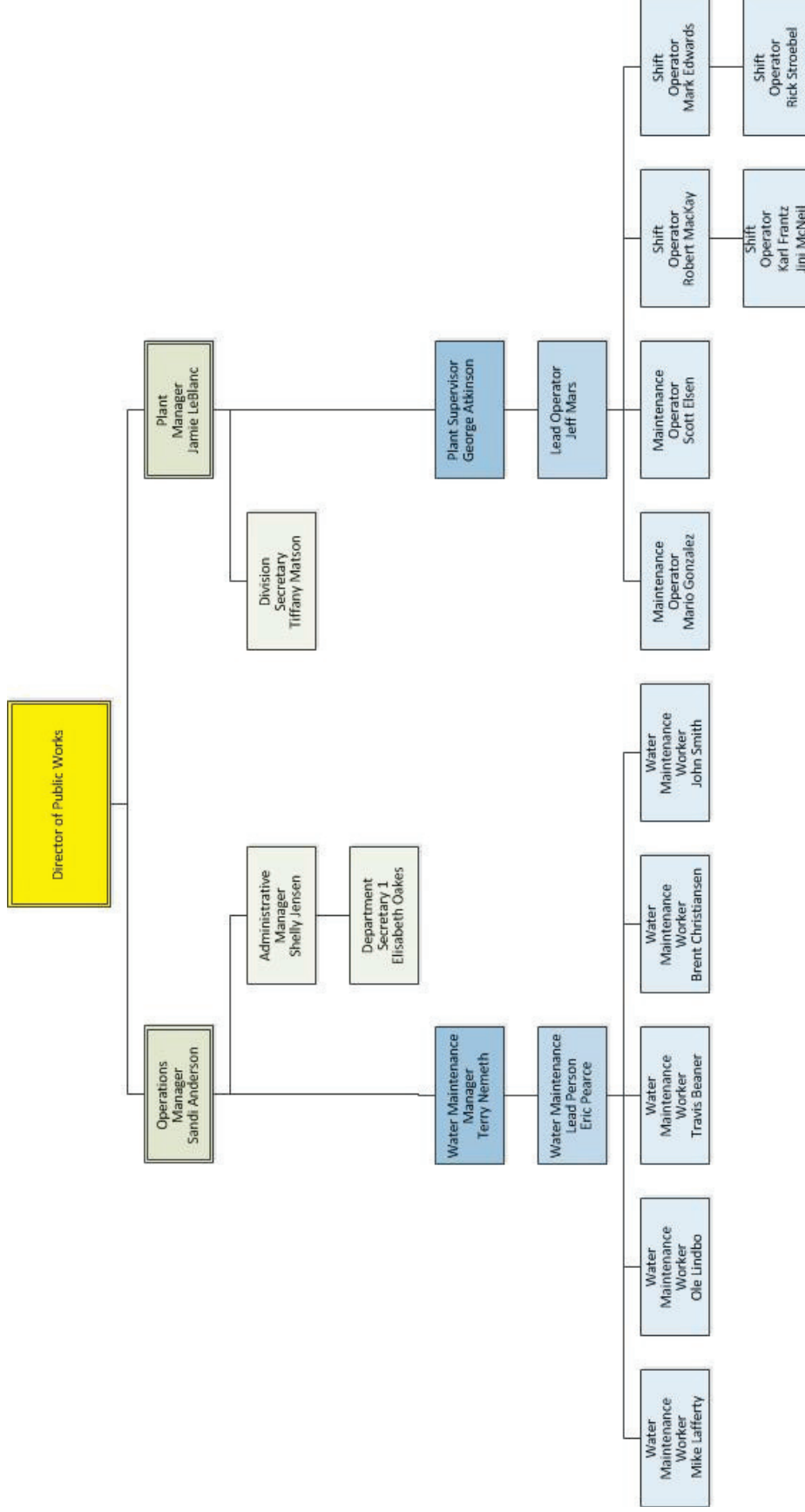


Figure 9-1 Organizational Chart

9.2. Operator Certifications

Chapter 70.119 Revised Code of Washington (RCW) requires that Group A public water systems have a certified operator on staff. Responsibilities of the certified operator may include supervising (1) the technical direction of a water system’s operation, (2) an operating shift of such a system, or (3) a major segment of a system necessary for monitoring or improving the quality of water. Chapter 246-292 Washington Administrative Code (WAC) provides the requirements for certification of the water works operator.

Anacortes supports and encourages in-house training and external training opportunities for operators, for continuing education. Table 9-1 lists the operations staff’s certification levels and requirements.

Table 9-1 Operator Certification

POSITION	STAFF MEMBER	CERTIFICATION	CERTIFICATION REQUIREMENT
WATER TREATMENT DIVISION			
Plant Manager	Jamie LeBlanc	WTPO 4 & WDM 3	WTPO 4 & WDM 3
Plant Supervisor	George Atkinson	WTPO 3	WTPO 3
Shift Operator	Karl Frantz	WTPO 3	WTPO 3
Day Shift Op/Maintenance	Scott Eisen	WTPO 2, WDM 2	WTPO 3
Shift Operator	Jini McNeil	WTPO 1, WDM 1	WTPO 3
Lead Operator	Jeff Marrs	WTPO 2, WDM 2	WTPO 2
Shift Operator	Bob MacKay	WTPO 3 & WDM 2	WTPO 3
Day Shift Op/Maintenance	Mario Gonzalez	WTPO 2	WTPO 2
Shift Operator	Mark Edwards	WTPO 3 & WDM 3	WTPO 3
Shift Operator	Rick Stroebel	WTPO 4, WDM 2	WTPO 3
OPERATIONS DIVISION			
Public Works Supervisor (Water)	Terry Nemeth	WDM 3 & CCS	WDM 3 & CCS
Water Maintenance Lead Worker	Eric Pearce	MDM 2	MDM 2
Water Maintenance Worker	Ole Lindbo	-	-
Water Maintenance Worker	Mike Lafferty	-	-
Water Maintenance Worker	John Smith	-	-
Water Maintenance Worker	Travis Beaner	Taking WDM 1 in June	-
Water Maintenance Worker	Brent Christensen	Taking WDM 1 in Oct	-

Notes:

- CCS = Cross-connection Control Specialist
- CSS = Collection System Specialist
- WDM = Water Distribution Manager
- WTPO = Water Treatment Plant Operator

9.3. System Operations and Control

Both divisions maintain an up-to-date Operations and Maintenance (O&M) manual for their respective areas of responsibility. Copies of these manuals have not been provided due to their size.

9.3.1. Identification of Major System Components and Routine Operations

Refer to Section 2 of this plan and to the plant and distribution system O&M manuals for information pertaining to the system components and routine operations. This information is provided in detail in these resources.

9.3.2. Routine System Operations

All treatment plant operations are described in the Operator in Training (OIT) Guide. This guide provides a step-by-step guide to the water treatment facility from plant intake to the distribution system. There is also an Operations Plan for the WTP which describes the processes at the plant. The day-to-day activities are scheduled and communicated through a weekly schedule and meetings. Treatment plant staff members use an on-line log book to assist in recording daily activities.

All water distribution system operations are described in Chapter 3 of the Distribution System O&M manual. The day-to-day activities are scheduled and communicated through a weekly schedule and meetings.

9.3.3. Preventive Maintenance Program

All preventive maintenance activities are described in detail in the plant and distribution system O&M manuals and the treatment plant OIT guide. These manuals are enhanced with the use of individual preventive maintenance databases for each system. Planning, scheduling, and records keeping are provided by the individual databases. Manufacturers' equipment O&M manuals are also available for reference.

9.3.4. Equipment Supplies and Chemical Listings

The distribution system crew maintains redundancy in all required equipment. If one piece of equipment fails or is in the shop for maintenance, the crew has a second one to take its place. The distribution system chemical supply is very limited; most chemicals used are over-the-counter supplies. Ample supplies of food-grade grease and dechlorination tablets are maintained to ensure that a supply is available when needed.

In a database, the WTP staff keeps records of all stored chemicals and equipment. As a chemical is removed from storage, its removal is recorded in the database and a reorder request is submitted. When the chemical is delivered to the site, the database is updated to reflect the additional supply. The database provides various reports to ensure that a sufficient quantity of each chemical is available when needed.

The WTP's Computerized Maintenance Management System (CMMS) has a chemical inventory database; however, this system is not used. There is currently no link between the WTP's chemical inventory database and the CMMS.

A current list of all chemical and equipment suppliers is made available through Microsoft® Outlook contacts.

A complete set of equipment O&M manuals is maintained at the WTP. Each pump station is also supplied with a set of equipment O&Ms specific to that station. Water meter services are contracted out to GC Systems.

9.4. Emergency Response Program

Anacortes has an extensive emergency response program, which is documented in the Anacortes Water Treatment Emergency Response Plan. This program was developed in 1994 by RH2 Engineers with input from Anacortes' staff. The program is annually updated as a whole. Each procedure is also evaluated for completeness in a postmortem meeting each time the procedure is used during an emergency situation.

The Plant Supervisor is responsible for the annual review. Procedural changes are discussed with the group prior to implementation to ensure correctness. The Plant Secretary is responsible for ensuring that all updates are distributed for insertion into paper copies of the program.

Copies of the program are located at the operations console in the plant control room, in the Plant Manager's vehicle, and in the Plant Supervisor's vehicle. Electronic copies are also available on local drives and on the network. The Plant Manager also maintains an electronic copy on his home computer.

A copy of the emergency response plan's Table of Contents is included for reference in Appendix 9-1.

9.5. Safety Procedures

Anacortes is committed to ensuring the safety of its operations and maintenance staff and safe operation of all facilities. Anacortes has a formal safety program that includes an Employee Safety Orientation Checklist. A copy of the Employee Safety Orientation Checklist is located in Appendix 9-2. This checklist ensures that all new employees receive the safety training and orientation required to provide safe working conditions.

Particular emphasis is placed on the following topics:

- Confined space entry
- Lock out / tag out
- Fall protection and rescue
- Scaffolding and ladder safety
- Personal hygiene
- Communication about hazards

New employees are issued proper safety equipment specific to the job assigned, and equipment is replaced as required. New safety equipment is requested with forms available at each location.

Anacortes has a formal job hazard analysis program. Each new job is reviewed to identify the potential for hazards. If a potential hazard is identified, the job is systematically reviewed to develop solutions. A copy of the hazards analysis guide and the hazards analysis form are provided in Appendix 9-3.

9.6. Cross-Connection Control Program

Anacortes' Cross-Connection Control Program (CCC) was reviewed as part of the Water System Plan update, and a copy of the plan is provided in Appendix 9-4. Under WAC-246-290-490, Anacortes has the responsibility to protect the public water system from ill effects associated with contamination due to cross-connection and backflow events. The CCC was developed to meet Washington State Department of Ecology (Ecology) requirements contained in WAC 246-290-490, and includes the key elements described below.

9.6.1. Establishment of Local Authority

Anacortes adopted resolution Number 1988 to authorize implementation of a CCC program. The resolution also authorizes Anacortes to terminate water service to consumers who do not comply with the resolution.

For customers supplied prior to adoption of the resolution, an implied service contract allows Anacortes to protect the distribution system from contamination through a system-installed backflow preventer on a customer's service.

9.6.2. Evaluation of Service Connections Hazards

The CCC provides procedures and schedules for determining the degree of hazard posed by new and existing service connections. For new services, Anacortes performs an initial cross-connection evaluation prior to construction. For existing services, Anacortes performs evaluations on a schedule; services with the highest potential hazard designation are assigned the highest priority.

New Non-residential Services

All new applications for non-residential services require a Washington State Department of Health (DOH) certified Cross-connection Control Specialist (CCS) to evaluate the hazard posed by the proposed plumbing system. The CCS will recommend installation at the meter of a double check valve assembly (DCVA), a reduced pressure principle backflow assembly (RPBA), or commensurate in premises backflow preventer. As an alternative and at Anacortes' discretion, Anacortes' CCS may provide the evaluation for the customer.

As an alternative to the requirement described above for a survey by a CCS, the customer may agree to install an approved air gap (AG) or RPBA for premises isolation as a condition of service.

New Residential Services

All new applications for residential services require the customer to submit a Water Use Questionnaire. If the questionnaire indicates that special plumbing such as a lawn sprinkler system will be used or that hazardous water use will take place on the premises, the customer is required to obtain an evaluation by a DOH-certified CCS with recommendations of a DCVA, a RPBA, or commensurate in-premises protection. As an alternative at Anacortes' discretion, Anacortes' CCS may provide the evaluation for the customer.

Existing Non-residential Services

For all existing non-residential services, Anacortes requires the owner or occupant to submit within 9 months of notification a DOH-certified CCS' evaluation of the hazards posed by the plumbing system. This evaluation will recommend installation at the meter of a DCVA, RPBA, or commensurate in-premises backflow preventer. Anacortes may accept the recommendations or submit the recommendations to a CCS employed by Anacortes for peer review and concurrence before acceptance. As an alternative and at Anacortes' discretion, Anacortes' CCS may provide the evaluation and specify the required backflow device.

As an alternative to the requirement described above for a survey by a DOH-certified CCS, the customer may agree to install an AG or RPBA for premises isolation within 90 days of notification by Anacortes, or within an alternative time period acceptable to Anacortes.

Existing Residential Services

For all existing residential services, Anacortes requires the owner or occupant to submit a Water Use Questionnaire within 4 months of notification. If the questionnaire indicates that special plumbing is present or that hazardous water use will take place on the premises, the customer is required to obtain an evaluation by a DOH-certified CCS with recommendations of a DCVA, an RPBA, or commensurate in-premises protection. As an alternative and at Anacortes' discretion, Anacortes' CCS may provide the evaluation for the customer.

Failure to Comply

For existing services, if the customer fails to supply the required information for a hazard assessment or fails to submit a completed Water Use Questionnaire, Anacortes may have the assessment made by a CCS employed by Anacortes, require installation of an RPBA for premises isolation, or take other such actions consistent with stated policies.

9.6.3. Eliminating or Controlling Cross-Connections

Anacortes requires that cross-connections be eliminated, if possible. If they cannot be eliminated, cross-connections are to be controlled and prevented by backflow prevention assemblies appropriate for the given situation.

9.6.4. Using a Qualified Cross-Connection Specialist

The responsibility for administration of the CCC program rests with Anacortes. General policy direction and risk management decisions are established by the Mayor. Through an interagency

agreement, the Local Administrative Authority (LAA) may undertake certain administrative tasks, and Anacortes may undertake additional tasks to assist the LAA.

Anacortes' program is implemented by a certified CCS. Anacortes has one employee who holds state certification as a CCS. If this employee left, Anacortes could retain a DOH-certified CCS on contract to provide the necessary expertise and services.

9.6.5. Assembly Testing and Inspection Procedures

Anacortes has procedures to ensure that the backflow prevention assemblies are installed properly and tested annually. Anacortes may require testing more frequently than once per year when the backflow device protects against a high-health hazard or when a device repeatedly fails tests or inspections. This process includes notification and correspondence between Anacortes and customers who own such assemblies.

9.6.6. Quality Assurance Program for Testing

Anacortes' quality assurance program requires that all backflow prevention assembly test reports submitted to Anacortes document that the tester is on Anacortes' annually-developed list of certified testers, and that the test kit used is in proper calibration.

9.6.7. Backflow Incident Response Procedure

Select Anacortes personnel are trained to respond to reported backflow incidents. The Anacortes Water Treatment Emergency Response Plan describes procedures for such responses and requirements for notifying the Skagit County Health Department and Ecology.

9.6.8. Public Education Program

The CCC program incorporates information on cross-connection control into Anacortes' existing public education program. Anacortes distributes cross-connection control brochures with water bills at regular intervals. Anacortes distributes the brochures every 2 to 3 years and when new customers sign their water service contracts.

Anacortes also participates in public outreach programs that distribute cross-connection information to local hardware and plumbing stores. Anacortes also participate in fairs, exhibits, and other events and provides an educational session for irrigation contractors, fire sprinkler contractors, etc.

9.6.9. Maintenance of Program Records

Records and Data

Anacortes uses the water utility database for storing, organizing, and tracking CCC records, including an inventory of information about service connections/customers' premises. The database includes the assessed degree of hazard and the required backflow preventer to protect the public water system, and backflow preventer inventory and related information.

Reporting

Anacortes' CCS will prepare and sign the following WAC reports:

- CCC program activities report for the calendar year, to be sent to DOH when requested.
- CCC program summary information, when required, or when there are significant policy changes.
- Backflow incident reports, to be sent to DOH (and voluntarily to the Pacific Northwest Section-American Waterworks Association [PNWS-AWWA] CCC Committee).
- Documentation when exceptions to mandatory premises isolation are granted.

These reports shall be reviewed and signed by the Public Works Supervisor (Water) before submission to DOH.

9.6.10. Recent CCC Report

In the most recent cross-connection annual summary report submitted to DOH, all high hazard premises had passed inspection and/or testing. A small percentage of low hazard fixtures were non-compliant and most of those fixtures have been either removed or shut off.

In the past years, the focus of the CCC program has been on compliance. Last year the due date for all irrigation systems to be tested was changed to no later than May. This helps insure they are tested before start up and allows the customer to potentially receive a price break with a higher volume of testing in their area.

Recent successes are in follow-up and education. Rather than a certified letter being sent for the second reminder, staff personally handle the non-compliance letter and inform the customer of the consequences. This also provides an opportunity to educate the customer about the importance of their assembly device in keeping the water clean and safe.

For the next six years, the focus will be to improve documentation to better handle non-compliance without disconnection, as well as to work more closely with the permit department to keep weekend irrigation installers in the system and in compliance. With communication and a few seminars with the local landscapers, continued success of the CCC program is anticipated.

9.7. Records Keeping and Reporting Program

Anacortes uses customized Information and Records Management systems and Microsoft® Access databases. By computer network tracking, distribution system personnel have developed a filing system that breaks down the reservoirs, distribution system, water meters, fire hydrants, and other necessary components that make up the service area. The WTP staff has developed a database that breaks down the treatment facility and the pumping stations. Both systems provide computerized access to information related to their areas of responsibility. Checks and balances have been implemented to ensure the records are updated in a timely manner. Hard copies of most documents are kept in each office for easy access should the electronic system fail.

When data are updated in the distribution system database, a note is automatically generated and sent to the geographic information system (GIS) coordinator to ensure that the GIS system is also updated in a timely manner. Field crews access GIS data as it is made available to ensure efficient responses to service problems and routine work.

The Public Works Supervisor (Water) and the Plant Manager are responsible for submitting all State-required monthly forms to appropriate agencies.

Records include, but are not limited to, the following:

- Water quality complaints
- Backflow prevention
- Maintenance and construction
- O&M manuals
- Personnel records
- Flushing and distribution system
- Surface Water Treatment Rule (SWTR) Disinfection Monthly Report
- Water Treatment Plant Monthly Report

9.8. Design and Construction Standards

Anacortes is currently using Engineering Standards that were approved in January 2009 (Edition 5). Those engineering, design, and construction standards set forth the minimum standards for the planning, design, and construction of water distribution systems, sanitary sewer systems, storm drain systems, streets, and erosion control measures.

The Engineering Standards are based on engineering design and construction methods and materials published in the most current editions of Washington State Department of Transportation (WSDOT) publications, as well as on other state and federal agency publications such as the Uniform Building Code and publications prepared by Ecology, the American Water Works Association, and the American Public Works Association.

The Engineering Standards document includes planning and material specifications as well as standard details, permit requirements, plan review checklists, construction and inspection forms, and a fee schedule for Engineering and Development Service fees. When a new project is submitted to Anacortes, all of the documents must meet the Design and Improvement Standards, along with the appropriate submittal checklist for the specific type of project. All approved plan sheets will receive a Plan Approval Block from the Public Works Department, signed by a representative of Anacortes.

The entire Engineering Standards document is not appended to this document; instead, Appendix 9-5 includes the portions of Anacortes' Engineering Standards that directly relate to this Water System Plan. Appendix 9-5 includes the following:

- Chapter 1 – General Considerations
- Chapter 6 – Water Engineering Standards

- Appendix A – Standard Drawings
- Appendix C – Plan Review Checklists

9.9. Recommended Improvements

Anacortes has all the required documentation for its overall O&M plan for both the treatment and distribution systems. The WTP will undertake a major overhaul in the next few years. Any O&M improvements that need to be capitalized appear in the Capital Improvements Plan (CIP) chapter of this report.

The following recommendations may increase efficiency and provide value to the operation of Anacortes' water system:

- Continue with the current pipe replacement program.
- Continue to create loops in all dead end lines, when possible, to improve water quality in those areas.
- Continue with hydrant testing and system hydraulic modeling to improve system efficiency and fire protection.
- Continue to ensure redundancy within the system. This will improve system efficiency and water quality.
- Continue to evaluate system-wide requirements as the system changes as a result of new hookup applications. Overall system analysis will provide valuable data for future CIP planning.
- Investigate electronic O&M manuals. This technology has greatly improved and provides easy access to up-to-date equipment manuals. It can also be used as a communication tool between the different departments, e.g., water, distribution, and wastewater. Having these communication links allows personnel from each of these groups to gain a better understanding of the entire water system. This understanding shows how one system modification affects another.